IN THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Currently Amended) A radiation source apparatus comprising:

a radiation source unit configured to supply radiation of desired wavelengths and radiation of undesired wavelengths; and

a grating spectral filter configured to ~~pass~~ diffract said radiation of desired wavelengths into a zeroth-order beam to form a projection beam of radiation and to diffract said radiation of undesired wavelengths away from said radiation of desired wavelengths.

2. (Original) A radiation source apparatus according to claim 1 wherein said grating spectral filter comprises a blazed grating.

3. (Original) A radiation source apparatus according to claim 2 wherein said grating spectral filter has a blazing angle less than about 2.5°.

4. (Original) A radiation source apparatus according to claim 2 wherein said grating spectral filter has a line density in the range of from 200 to 700 lines per mm.

5. (Original) A radiation source apparatus according to claim 1 wherein said grating spectral filter is a laminar grating.

6. (Previously Presented) A radiation source apparatus according to claim 1 wherein said grating spectral filter is configured to allow said radiation of said desired wavelengths to pass therethrough without substantially changing said radiation of said desired wavelengths.

7. (Original) A radiation source apparatus according to claim 6 wherein said grating spectral filter is substantially formed of a material that allows said radiation of said desired wavelengths to pass therethrough without substantially changing said radiation of said desired wavelengths.

8. (Original) A radiation source apparatus according to claim 7 wherein said grating spectral filter is substantially formed of a material having a refractive index close to unity at said desired wavelengths.

9. (Original) A radiation source apparatus according to claim 8 wherein said grating spectral filter comprises silicon.

10. (Original) A radiation source apparatus according to claim 1 further comprising a cooling element provided in thermal contact with said grating spectral filter.

11. (Original) A radiation source apparatus according to claim 10 wherein said cooling element comprises coolant channels.

12. (Original) A radiation source apparatus according to claim 11 further comprising a cooling system for passing coolant fluid through said coolant channels.

13. (Original) A radiation source apparatus according to claim 1 wherein said grating spectral filter is a reflective filter.

14. (Original) A radiation source apparatus according to claim 1 wherein said grating spectral filter is a grazing incidence reflector.

15. (Original) A radiation source apparatus according to claim 13 wherein said grating spectral filter is integral with an optical element of said radiation source apparatus.

16. (Original) A radiation source apparatus according to claim 1 wherein said radiation of desired wavelengths has an approximate wavelength selected from the group comprising: 365 nm, 248 nm, 193 nm, 157 nm, 126 nm, from 8 nm to 20 nm and from 9 nm to 16 nm.

17. (Original) A radiation source apparatus according to claim 1 wherein said radiation source unit is a laser-produced, or discharge, plasma radiation source.

18. (Previously Presented) A radiation source apparatus according to claim 1 wherein a portion of said radiation of undesired wavelengths is diffracted by said grating spectral filter onto a structure selected from the group comprising: a heat sink, an aperture, a diaphragm, a beam dump, and combinations thereof.

19. (Currently Amended) A lithographic projection apparatus comprising:

a radiation source apparatus comprising a radiation source unit configured to supply radiation of desired wavelengths and a grating spectral filter configured to ~~pass~~ diffract said radiation of desired wavelengths into a zeroth-order beam to form a projection beam of radiation and to diffract radiation of undesired wavelengths supplied by said radiation source unit away from said radiation of desired wavelengths;

a support structure configured to support a patterning structure, the patterning structure being constructed and arranged to pattern the projection beam according to a desired pattern;

a substrate table configured to hold a substrate; and

a projection system configured to project the patterned beam onto a target portion of the substrate.

20. (Withdrawn) An optical element comprising:

a grating spectral filter for reflecting radiation of desired wavelengths to form a projection beam of radiation and for reflecting radiation of undesired wavelengths away from said projection beam.

21. (Withdrawn) An optical element according to claim 20 wherein said optical element is a multi-layer mirror.

22. (Withdrawn) An optical element according to claim 21 wherein said optical element further comprises a capping layer.

23. (Withdrawn) An optical element according to claim 22 wherein said capping layer comprises a material selected from the group comprising: carbon, ruthenium and combinations thereof.

24. (Withdrawn) An optical element according to claim 20 wherein said grating spectral filter is substantially formed of a material having a refractive index close to unity at said desired wavelengths.

25. (Withdrawn) An optical element according to claim 24 wherein said grating spectral filter comprises silicon.

26 (Withdrawn) An optical element according to claim 20 wherein said grating spectral filter comprises grooves in the surface of said optical element.

27. (Withdrawn) A lithographic projection apparatus comprising:

a radiation system to provide a projection beam of radiation;

a support structure to support patterning structure, the patterning structure being constructed and arranged to pattern the projection beam according to a desired pattern;

a substrate table to hold a substrate;

a projection system to project the patterned beam onto a target portion of the substrate; and

an optical element comprising a grating spectral filter for reflecting radiation of desired wavelengths to form said projection beam of radiation and for reflecting radiation of undesired wavelengths away from said projection beam.

28. (Previously Presented) A radiation source apparatus according to claim 1, wherein said grating spectral filter is configured to reflect said radiation of desired wavelengths to form the projection beam of radiation.

29. (Cancelled)

30. (Currently Amended) A radiation source apparatus according to claim 1 ~~claim 29~~, wherein substantially no radiation of undesired wavelengths is diffracted into the zeroth-order beam.